



Dart Hawkesbury  
1270 Aberdeen St  
Hawkesbury, ON  
K6A 1K7  
Canada

Tel (613) 632-5200

2

D3391-025  
Job Sheet 167283-A



Part No: D3391-025

Job Qty: 1 ea

Part Name: Aft Tube Assembly



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 10/27/17

Job Tracking No:

Due Date: 12/18/17

Created By: Victoria Michaud-Febrille

Type: SOLD

Description:

Customer: Falcon Aviation Services (CFALC01)

PO Box 62030 Abu Dhabi, United Arab Emirates ph:011 971 50 445 0187 fx:+971 2 444 0022.

Ship Via:

### Bill of Materials

### Job Routing

| Op No | Operation                     | Qty   | Start Date | Due Date | Standard  |         | Workcenter/Supplier   |           | Sign-off       |
|-------|-------------------------------|-------|------------|----------|-----------|---------|-----------------------|-----------|----------------|
|       |                               |       |            |          | Setup hrs | Run Hrs | Workcenter / Supplier | Lead Time |                |
| 90    | Start up Operation            | 1 Ea  |            | 12/15/17 | 0.00      | 0.00    | Start Up Skidtubes    |           |                |
| 100   | Mori Seiki                    | 1 pcs |            | 12/15/17 | 2.49      | 4.17    | Mori Seiki TL-40      |           | PMP            |
| 110   | QC                            | 1 pcs |            | 12/15/17 | 0.00      | 0.00    | QC2                   |           | PMP            |
| 112   | QC                            | 1 pcs |            | 12/15/17 | 0.00      | 0.00    | QC5                   |           | PD 17-11-13    |
| 120   | CNC Vertical Machining        | 1 pcs |            | 12/16/17 | 0.00      | 2.63    | HAAS 1                |           | Kt 17-11-03    |
| 130   | QC <i>As per attached</i>     | 1 pcs |            | 12/16/17 | 0.00      | 0.00    | QC2                   |           | Kt 17-12-03    |
| 140   | QC                            | 1 pcs |            | 12/16/17 | 0.00      | 0.00    | QC8                   |           | AK 12/12/04    |
| 150   | Skidtubes                     | 1 pcs |            | 12/16/17 | 0.00      | 1.03    | Skidtubes             |           | M6/6           |
| 160   | CNC Bend Skidtubes            | 1 pcs |            | 12/16/17 | 0.00      | 1.33    | CNC Bend Skidtube     |           | M6/6           |
| 170   | QC                            | 1 pcs |            | 12/16/17 | 0.00      | 0.00    | QC5                   |           | BE             |
| 180   | Skidtubes                     | 1 pcs |            | 12/16/17 | 0.00      | 1.03    | Skidtubes             |           | M6/6 DAS       |
| 190   | QC                            | 1 pcs |            | 12/16/17 | 0.00      | 0.00    | QC5                   |           | 38             |
| 200   | HandFinish                    | 1 pcs |            | 12/16/17 | 0.00      | 0.58    | HandFinish1           |           | 2017-12-19 JSC |
| 210   | QC                            | 1 pcs |            | 12/16/17 | 0.00      | 0.00    | QC7                   |           | AK             |
| 220   | Skidtubes                     | 1 pcs |            | 12/16/17 | 0.00      | 1.41    | Skidtubes             |           | AP 2017/12/20  |
| 230   | QC                            | 1 pcs |            | 12/16/17 | 0.00      | 0.00    | QC5                   |           | AK 17-12-22    |
| 235   | HandFinish                    | 1 pcs |            | 12/16/17 | 0.00      | 0.58    | HandFinish2           |           | 2017-12-22 JSC |
| 240   | Spray Paint <i>ent source</i> | 1 pcs |            | 12/16/17 | 0.00      | 0.25    | Spray Paint           |           | PO039670       |
| 250   | QC                            | 1 pcs |            | 12/16/17 | 0.00      | 0.00    | QC14                  |           | AK 17-12-27    |
| 260   | HandFinish                    | 1 pcs |            | 12/18/17 | 0.00      | 0.58    | HandFinish4           |           | AK 17-12-27    |
| 270   | QC                            | 1 pcs |            | 12/18/17 | 0.00      | 0.00    | QC5                   |           |                |
| 280   | Packaging                     | 1 pcs |            | 12/18/17 | 0.00      | 0.00    | Packaging3            |           |                |
| 290   | QC21-SA                       | 1 Ea  |            | 12/18/17 | 0.00      | 0.00    | QC21                  |           |                |

Part Op 100 - Turn as per Folio FA599 Rev: AA & Dwg D3391 Rev: 5 \*\*\*ensure steady rest is turning true\*\*\* \*\*\*\*\*REMOVE  
Descriptions: STEADY REST AND MACHINIG MARKS\*\*\*\*

120 - 1-Machine as per Folio FA 599 Rev: AA & Dwg D3391 Rev: 5

140 - \*\*\*INSPECT INSIDE BORE\*\*\*

150 - 1-Drill (PILOT HOLE) aft cap holes per Dwg D3391 using DT8803

160 - Form as per Dwg D3391 Using Bend Prog 3391025 4.085

180 - 1-Open Aft cap pilot hole to .208" as per Dwg D3391 2-Drill float bag holes using DT8809 as per Dwg D3391(Holes marked "A" Only. 3-Drill wearplate holes as per Dwg D3391 using DT8878(Mid Tube) & DT8217 Wearplate Jig. \*\*\*\*\*Do Not Open To Finished Size\*\*\*\*\* 4-Drill Wearshoe holes as per DWG D3391 using DT8939 locating from 2 previously drilled aft wearplate holes. 5-Open wearplate holes to 0.297" and c'bore as per dwg D3391 6-Open up all float bag holes to 0.328" and c'sink as per Dwg D3391. 8- Scribe batch # on fwd end

**DART**  
AEROSPACE  
**S008527**

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TEL.: 1 613 632-5200  
Email: sales@dartaero.com  
www.dartaerospace.com



**Aft Tube Assembly**

**PART NO: D3391 - 025**  
**Revision:**  
**Operation: Start up Operation**  
**Change No:**

**Mfg Date: 11/09/17**

**Job No: 167283 - A**

5



220 - 1- Instal spacers as per dwg D3391 A/R Magnabond 6398 Batch: M137712 exp. date: 2018/01 cure time 12hrs as per QSI0015 2- Grind crossbolts flush 3- Back drill using #9 drill 4- Touchup Magnabond 5- Debur  
 235 - AND REALODINE AS PER PAR09-043  
 240 - PRIME AS PER DWG AND QSI005 4.2.1.3.3  
 260 - 1-Install inserts as per Dwg D3391 2-Install Aft Cap as per Dwg D3391 A/ R Sikaflex-241/-291 M13865 C  
 Sikaflex expiry date: 28/03 3- INSTALL WEARPLATES AS PER DWG  
 290 - 5- Detail DD, open (5) forward wearplate holes 0.375", then use DT10247 and drill holes for nutplates and c'sink.  
 6-Open wearplate holes to 0.297" and c'bore as per dwg D3391. \*\*\*SIX FARTHEST AFT HOLES ONLY\*\*\* 7-Open up all float bag holes to 0.328" and c'sink as per Dwg D3391. 8-Debur 9- Scribe batch # on fwd end

#### Job Allocations

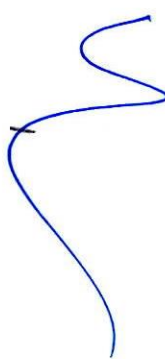
| Operation                | Component Part                | Required | Inventory | Allocated | Std Qty |
|--------------------------|-------------------------------|----------|-----------|-----------|---------|
| 90-Start up Operation    | D6014-090 <u>F139427</u>      | 1        | 42        | 0         | 0       |
| 220-Skidtubes            | D3670-4-200 <u>B165393</u>    | 4        | 79        | 0         | 0       |
| 260-HandFinish           | ALS4-1032-130 <u>5007279</u>  | 8        | 1,343     | 0         | 0       |
|                          | D4095-047 <u>F164735</u>      | 1        | 20        | 0         | 0       |
|                          | D4095-049 <u>M161988-126</u>  | 1        | 18        | 0         | 0       |
|                          | MS20601-AD4W3 <u>5016824</u>  | 12       | 150       | 0         | 0       |
|                          | MS20601-AD4W7 <u>M137148</u>  | 8        | 313       | 0         | 0       |
|                          | MS21075L5 <u>FM138042</u>     | 10       | 173       | 0         | 0       |
| 270-QC <u>FM135948-2</u> | ✓ALS4-1032-225 <u>5027325</u> | 4        | 897       | 0         | 0       |
|                          | AN3C4A <u>500533</u>          | 6        | 1,670     | 0         | 0       |
|                          | ✓AN3C5AF <u>M137710-1</u>     | 4        | 364       | 0         | 0       |
|                          | ✓D2646 <u>F164005</u>         | 1        | 151       | 0         | 0       |
|                          | D3672-1 <u>F150074</u>        | 2        | 1,777     | 0         | 0       |
| <u>FM138409-1</u>        | → NAS1149C0332R               | 10       | 4,758     | 0         | 0       |

#### Part Specifications

Specifications could not be found.

Plex 10/27/17 1:53 PM dart.Michaud-Febrille.Victoria

OP 100 06014-090 B139427



# D3391-041/-043 FLOAT SKIDTUBE ASSEMBLY PARTS LIST

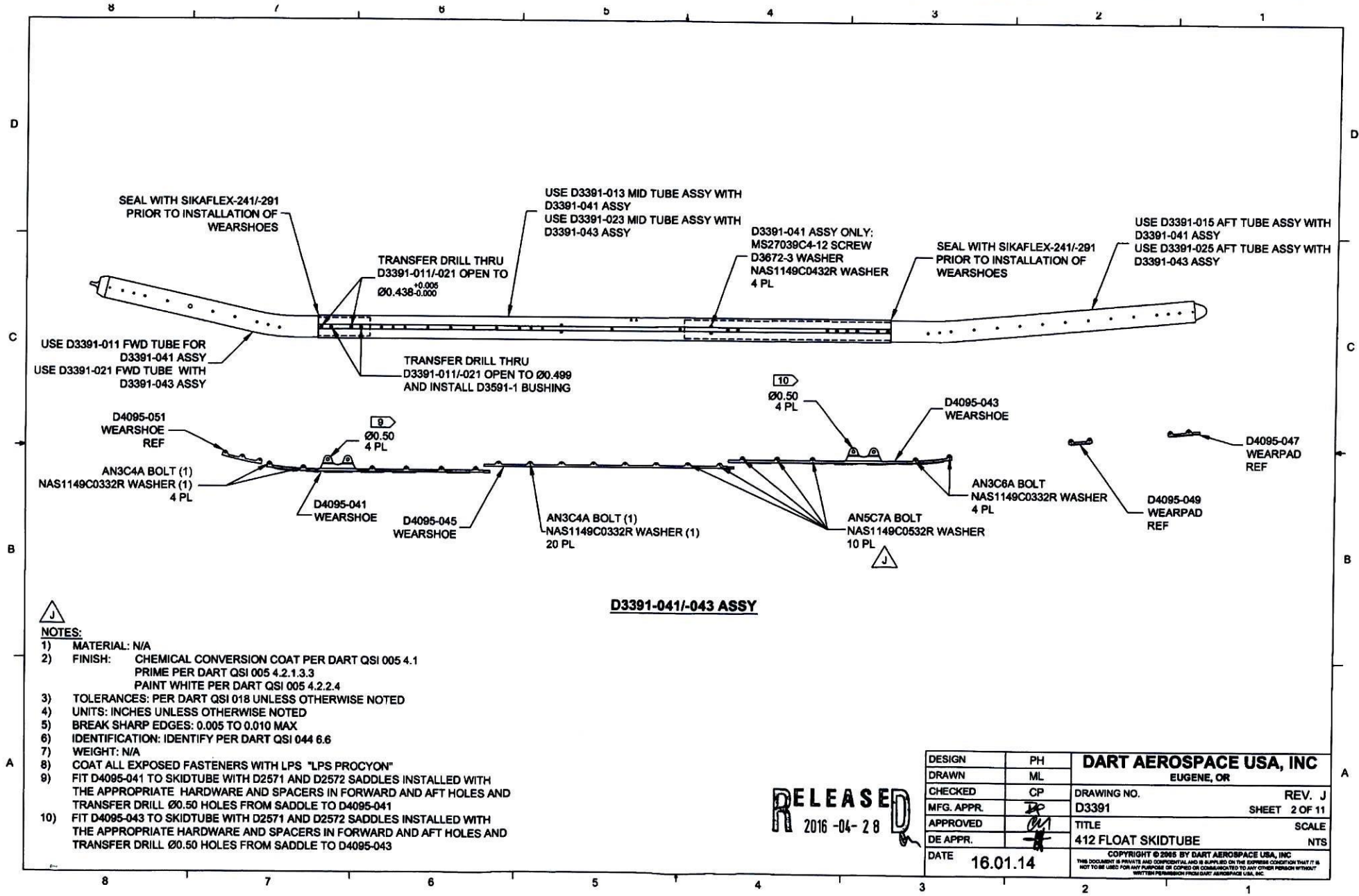
| QTY<br>-041 | QTY<br>-043 | PART NUMBER   | DESCRIPTION             |
|-------------|-------------|---------------|-------------------------|
| X           | X           | D3391-041     | FLOAT SKIDTUBE ASSEMBLY |
|             |             | D3391-043     | FLOAT SKIDTUBE ASSEMBLY |
| 1           |             | D3391-011     | FWD TUBE ASSEMBLY       |
| 1           |             | D3391-013     | MID TUBE ASSEMBLY       |
| 1           |             | D3391-015     | AFT TUBE ASSEMBLY       |
|             | 1           | D3391-021     | FWD TUBE ASSEMBLY       |
|             | 1           | D3391-023     | MID TUBE ASSEMBLY       |
|             | 1           | D3391-025     | AFT TUBE ASSEMBLY       |
| 2           | 2           | D3591-1       | BUSHING                 |
| 4           |             | D3672-3       | WASHER                  |
| 1           | 1           | D4095-041     | WEARSHOE                |
| 1           | 1           | D4095-043     | WEARSHOE                |
| 1           | 1           | D4095-045     | WEARSHOE                |
| 1           | 1           | D4095-047     | WEARPAD                 |
| 1           | 1           | D4095-049     | WEARPAD                 |
| 1           | 1           | D4095-051     | WEARSHOE                |
| 24          | 24          | AN3C4A        | BOLT                    |
| 4           | 4           | AN3C8A        | BOLT                    |
| 10          | 10          | AN5C7A        | BOLT                    |
| 28          | 28          | NAS1149C0332R | WASHER                  |
| 10          | 10          | NAS1149C0532R | WASHER                  |
| 4           |             | MS27039C4-12  | SCREW                   |
| 4           |             | NAS1149C0432R | WASHER                  |

J

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DRAWING  
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SHOULD BE IDENTICAL  
WITH THE ORIGINAL  
DRAWING UNDER  
NO.

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2016-06-28  
ECN 16-516

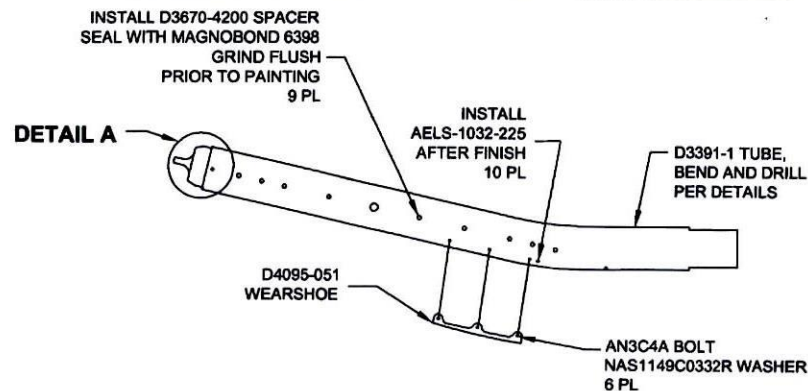
|            |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                    |               |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| J          | INCORPORATED DSI 9733, REFORMAT DRAWING CHANGED CBORE DEPTH (ZN D2-8, D2-9), REVISED TABLES, REPLACED POWDER COAT WITH PAINT                                                                                                                                                         | ML                                                                                                                                                                                                                                                                                 | 16.01.14      |
| I          | REMOVE GASKETS AND REPLACE ALL WEARSHOES; PARTS LIST UPDATE, ZN A8-1, ZN A8-2, ZN A6-4, ZN B6-8; LPS-3 COATING REMOVED FROM NOTE 2, ZN A3-1, ZN A3-2, REMOVED INSERT AELS-1032-130, ZN B6-4, B2-4, C7-8, C3-8; REMOVED HOLES, ZN D6-4 ZN D2-4, ZN D7-8, ZN D3-8                      | XDF                                                                                                                                                                                                                                                                                | 11.10.13      |
| H          | DRAWING UPDATED TO CURRENT STANDARDS. SHT 1 PL ADDED D3591-1 BUSHING. ZN C8 Ø0.438 DIM WAS 4 PL. ADDED Ø0.499 DIM AND D3591-1 BUSHING. SHT 2 PL ADDED D3591-1 BUSHING. ZN C8 Ø0.438 DIM WAS 4 PL. ADDED Ø0.499 DIM AND D3591-1 BUSHING. (FOR FURTHER INFO SEE DSI 9364 & NCR 08-074) | AJS                                                                                                                                                                                                                                                                                | 08.08.20      |
| G          | REPLACE NAS INSERTS W/ AELS INSERTS SWITCH TO D3670-XXXX SPACERS FOR INSTALLING FLOAT BAGS, DWG REORGANIZED FOR CLARITY                                                                                                                                                              | DC                                                                                                                                                                                                                                                                                 | 07.07.31      |
| F          | ADD SS WEARSHOE, GASKET REMOVE FWD SADDLE HOLE -011/-021                                                                                                                                                                                                                             | PH                                                                                                                                                                                                                                                                                 | 07.01.18      |
| E          | CHANGE TOLERANCE, EASE MANUFACTURE                                                                                                                                                                                                                                                   | PH                                                                                                                                                                                                                                                                                 | 06.04.25      |
| D          | UPDATE TOLERANCE, CHANGE HOLE SIZE                                                                                                                                                                                                                                                   | PH                                                                                                                                                                                                                                                                                 | 06.01.23      |
| C          | LENGTHEN AFT EXTENSION                                                                                                                                                                                                                                                               | PH                                                                                                                                                                                                                                                                                 | 05.09.27      |
| B          | DRAWING UPDATES                                                                                                                                                                                                                                                                      | PH                                                                                                                                                                                                                                                                                 | 05.06.10      |
| A          | NEW ISSUE                                                                                                                                                                                                                                                                            | PH                                                                                                                                                                                                                                                                                 | 05.02.07      |
| REV        | DESCRIPTION                                                                                                                                                                                                                                                                          | BY                                                                                                                                                                                                                                                                                 | DATE          |
| DESIGN     | PH                                                                                                                                                                                                                                                                                   | DART AEROSPACE USA, INC<br>EUGENE, OR                                                                                                                                                                                                                                              |               |
| DRAWN      | ML                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                    |               |
| CHECKED    | CP                                                                                                                                                                                                                                                                                   | DRAWING NO.                                                                                                                                                                                                                                                                        | REV. J        |
| MFG. APPR. | DP                                                                                                                                                                                                                                                                                   | D3391                                                                                                                                                                                                                                                                              | SHEET 1 OF 11 |
| APPROVED   | DP                                                                                                                                                                                                                                                                                   | TITLE                                                                                                                                                                                                                                                                              | SCALE         |
| DE APPR.   | DP                                                                                                                                                                                                                                                                                   | 412 FLOAT SKIDTUBE                                                                                                                                                                                                                                                                 | NTS           |
| DATE       | 16.01.14                                                                                                                                                                                                                                                                             | COPYRIGHT © 2005 BY DART AEROSPACE USA, INC<br>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE USA, INC. |               |



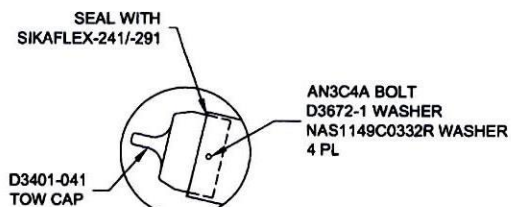
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|            |          |                                                                                                                                                                                                                                                                                    |               |
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| DESIGN     | PH       | DART AEROSPACE USA, INC                                                                                                                                                                                                                                                            |               |
| DRAWN      | ML       | EUGENE, OR                                                                                                                                                                                                                                                                         |               |
| CHECKED    | CP       | DRAWING NO.                                                                                                                                                                                                                                                                        | REV. J        |
| MFG. APPR. | DP       | D3391                                                                                                                                                                                                                                                                              | SHEET 2 OF 11 |
| APPROVED   | DP       | TITLE                                                                                                                                                                                                                                                                              | SCALE         |
| DE APPR.   | DP       | 412 FLOAT SKIDTUBE                                                                                                                                                                                                                                                                 | NTS           |
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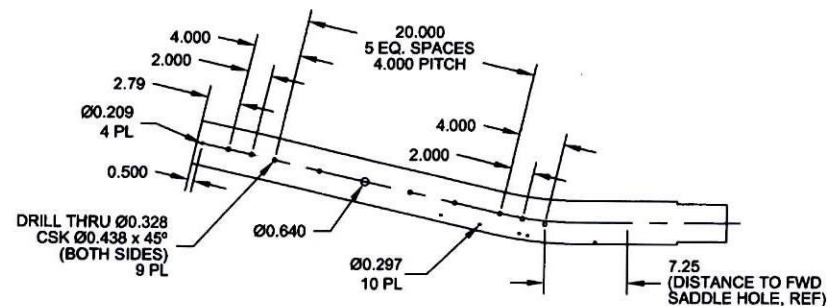




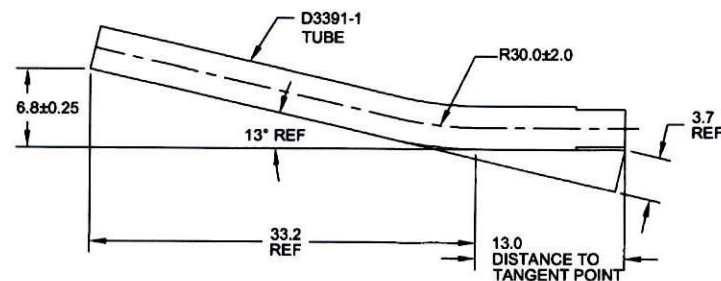
**D3391-011 FWD TUBE ASSEMBLY**  
ASSEMBLY DETAIL



**DETAIL A**  
SCALE 2X



**D3391-011 DRILLING DETAIL**



**D3391-011 BENDING DETAIL**  
(MAKE FROM D3391-1)

**D3391-011 FWD TUBE ASSEMBLY PARTS LIST**

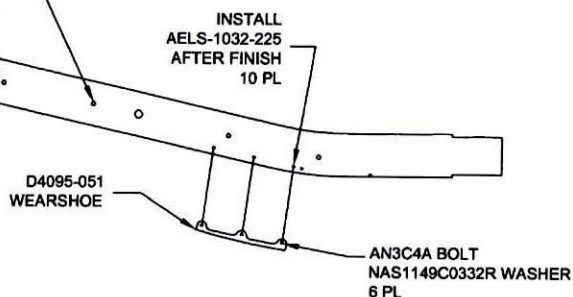
| QTY<br>-011 | PART NUMBER   | DESCRIPTION       |
|-------------|---------------|-------------------|
| X           | D3391-011     | FWD TUBE ASSEMBLY |
| 1           | D3391-1       | TUBE              |
| 1           | D3401-041     | TOW CAP           |
| 9           | D3670-4200    | SPACER            |
| 4           | D3672-1       | WASHER            |
| 1           | D4095-051     | WEARSHOE          |
| 10          | AELS-1032-225 | INSERT            |
| 10          | AN3C4A        | BOLT              |
| 10          | NAS1149C0332R | WASHER            |

|            |          |                                                                                                                                                                                                                                                                                    |               |
|------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| DESIGN     | PH       | <b>DART AEROSPACE USA, INC</b>                                                                                                                                                                                                                                                     |               |
| DRAWN      | ML       | EUGENE, OR                                                                                                                                                                                                                                                                         |               |
| CHECKED    | CP       | DRAWING NO.                                                                                                                                                                                                                                                                        | REV. J        |
| MFG. APPR. |          | D3391                                                                                                                                                                                                                                                                              | SHEET 3 OF 11 |
| APPROVED   |          | TITLE                                                                                                                                                                                                                                                                              | SCALE         |
| DE APPR.   |          | 412 FLOAT SKIDTUBE                                                                                                                                                                                                                                                                 | NTS           |
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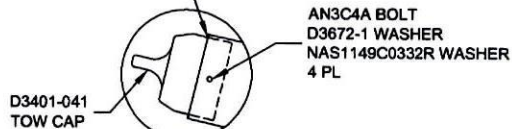
INSTALL D3670-4200 SPACER  
SEAL WITH MAGNOBOND 6398  
GRIND FLUSH  
PRIOR TO PAINTING  
4 PL

### DETAIL B



**D3391-021 FWD TUBE ASSEMBLY**  
ASSEMBLY DETAIL

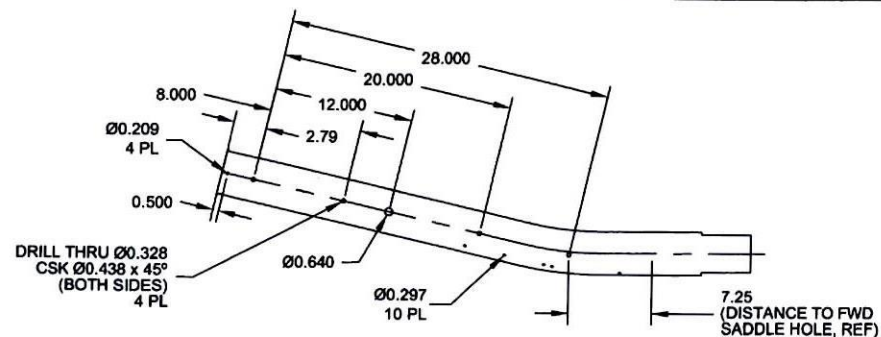
SEAL WITH  
SIKAFLEX-241/-291



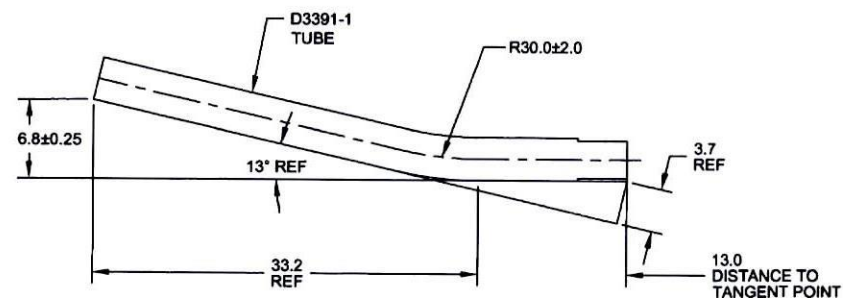
**DETAIL B**  
SCALE 2X

### D3391-021 FWD TUBE ASSEMBLY PARTS LIST

| QTY<br>-021 | PART NUMBER   | DESCRIPTION       |
|-------------|---------------|-------------------|
| X           | D3391-021     | FWD TUBE ASSEMBLY |
| 1           | D3391-1       | TUBE              |
| 1           | D3401-041     | TOW CAP           |
| 4           | D3670-4200    | SPACER            |
| 4           | D3672-1       | WASHER            |
| 1           | D4095-051     | WEARSHOE          |
| 10          | AELS-1032-225 | INSERT            |
| 10          | AN3C4A        | BOLT              |
| 10          | NAS1149C0332R | WASHER            |



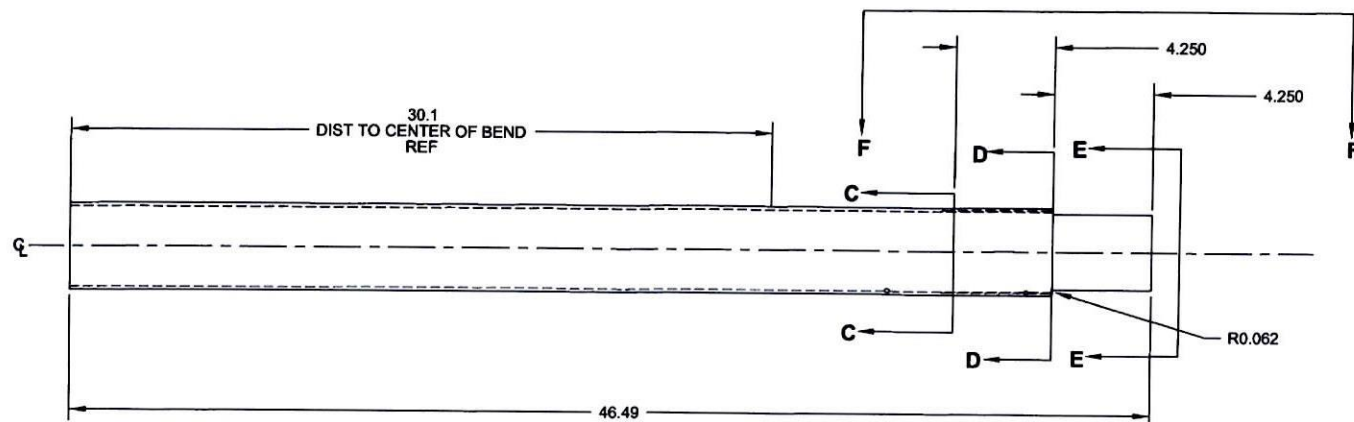
**D3391-021 DRILLING DETAIL**



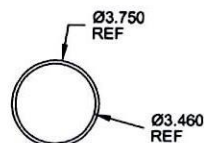
**D3391-021 BENDING DETAIL**  
(MAKE FROM D3391-1)

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2016-04-28

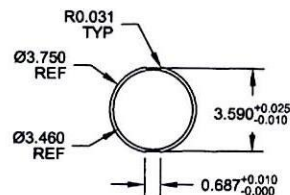
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|------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| DESIGN     | PH       | <b>DART AEROSPACE USA, INC</b>                                                                                                                                                                                                                                                    |               |
| DRAWN      | ML       | EUGENE, OR                                                                                                                                                                                                                                                                        |               |
| CHECKED    | CP       | DRAWING NO.                                                                                                                                                                                                                                                                       | REV. J        |
| MFG. APPR. | DE       | D3391                                                                                                                                                                                                                                                                             | SHEET 4 OF 11 |
| APPROVED   | DE       | TITLE                                                                                                                                                                                                                                                                             | SCALE         |
| DE APPR.   | DE       | 412 FLOAT SKIDTUBE                                                                                                                                                                                                                                                                | NTS           |
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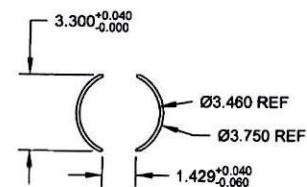
**D3391-1 TUBE**  
(MAKE FROM D6013-047 SKIDTUBE MATERIAL)



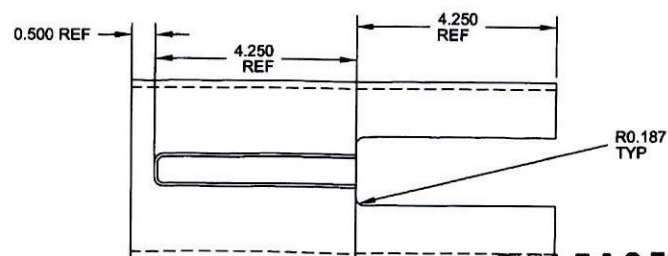
**SECTION C-C**



**SECTION D-D**



**SECTION E-E**

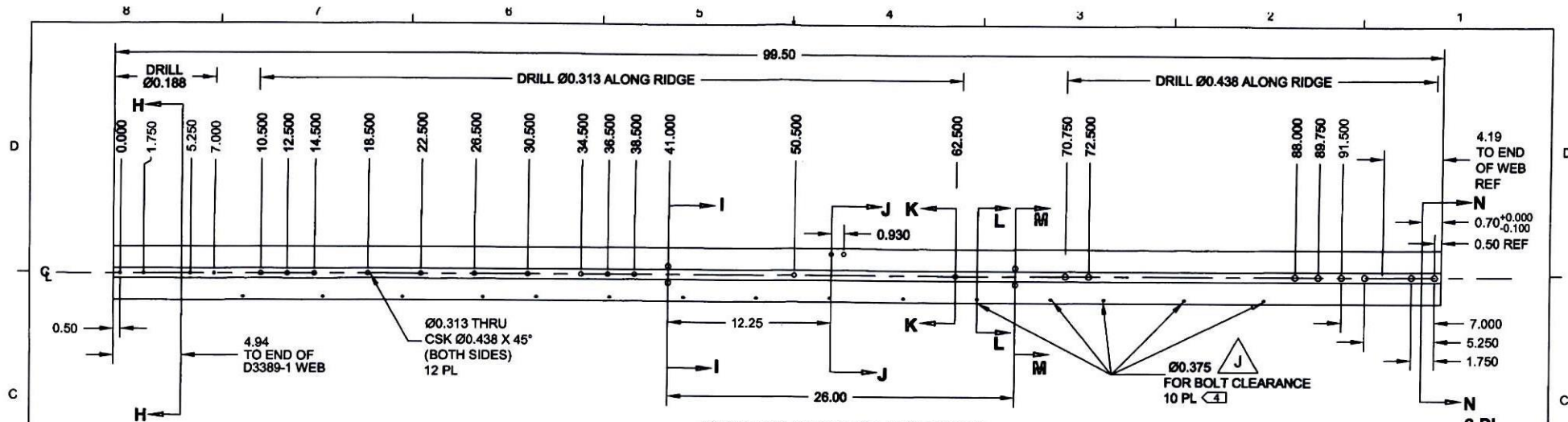


**VIEW F-F**  
SCALE 2X

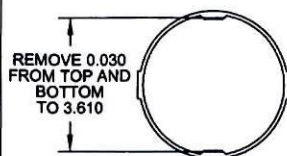
|                                                                                                                                                                                                                                     |           |                                             |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------|---------------|
| DESIGN                                                                                                                                                                                                                              | PH        | <b>DART AEROSPACE USA, INC</b>              |               |
| DRAWN                                                                                                                                                                                                                               | ML        | EUGENE, OR                                  |               |
| CHECKED                                                                                                                                                                                                                             | CP        | DRAWING NO.                                 | REV. J        |
| MFG. APPR.                                                                                                                                                                                                                          | <i>22</i> | D3391                                       | SHEET 5 OF 11 |
| APPROVED                                                                                                                                                                                                                            | <i>22</i> | TITLE                                       | SCALE         |
| DE APPR.                                                                                                                                                                                                                            | <i>22</i> | 412 FLOAT SKIDTUBE                          | NTS           |
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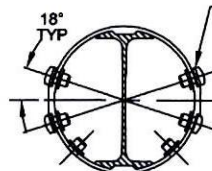




### D3391-013 MID TUBE ASSEMBLY

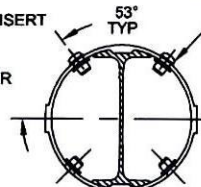


**SECTION H-H**  
SCALE 2X



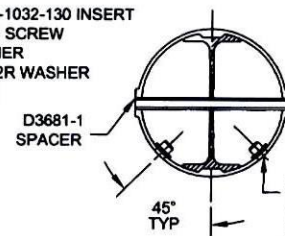
**SECTION I-I**  
SCALE 2X

DRILL Ø0.391  
INSTALL ALS4-428-165 INSERT  
MS27039C4-08 SCREW  
D3672-3 WASHER  
NAS1149C0432R WASHER  
AFTER FINISH  
4 PL

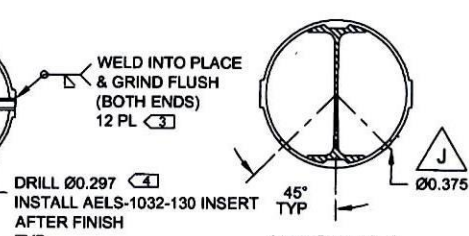


**SECTION J-J**  
SCALE 2X

DRILL Ø0.297  
INSTALL AELS-1032-130 INSERT  
MS27039C1-09 SCREW  
D3672-1 WASHER  
NAS1149C0332R WASHER  
AFTER FINISH  
4 PL



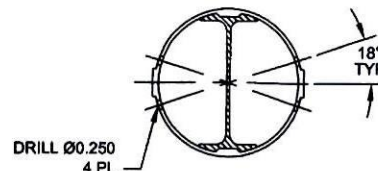
**SECTION K-K**  
SCALE 2X



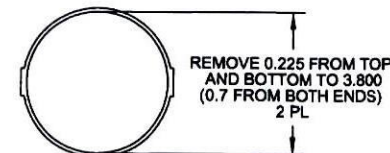
**SECTION L-L**  
SCALE 2X

### D3391-013 MID TUBE ASSEMBLY PARTS LIST

| QTY  | PART NUMBER   | DESCRIPTION       |
|------|---------------|-------------------|
| -013 |               |                   |
| X    | D3391-013     | MID TUBE ASSEMBLY |
| 1    | D2500-1-100   | EXTRUSION         |
| 1    | D3389-1       | WEB               |
| 4    | D3672-1       | WASHER            |
| 4    | D3672-3       | WASHER            |
| 12   | D3681-1       | SPACER            |
| 24   | AELS-1032-130 | INSERT            |
| 4    | ALS4-428-165  | INSERT            |
| 4    | MS27039C1-09  | SCREW             |
| 4    | MS27039C4-08  | SCREW             |
| 4    | NAS1149C0332R | WASHER            |
| 4    | NAS1149C0432R | WASHER            |



**SECTION M-M**  
SCALE 2X



**SECTION N-N**  
SCALE 2X



### D3391-013 MID TUBE ASSEMBLY

- 1) MATERIAL: MAKE FROM D2500-1-100
- 2) INSTALL D3389-1 WEB TO OUTER TUBE USING SIKAFLEX-241/-291 PER QSI 015
- 3) WELDING: PER DART QSI 004
- 4) USE DART DRILL TEMPLATE DT8217 TO LOCATE AND DRILL Ø0.297 AND Ø0.375 HOLES FOR WEARSHOE INSERTS AND NUTPLATES. CBOR AS NOTED AND INSTALL INSERT/NUTPLATES EXCEPT WHERE INDICATED.

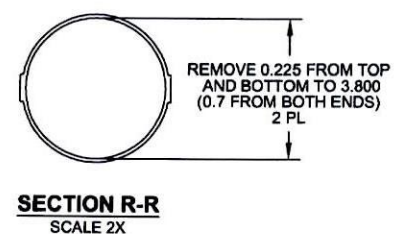
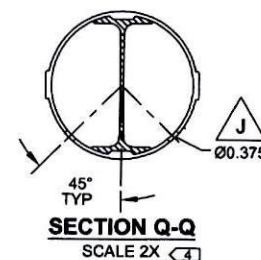
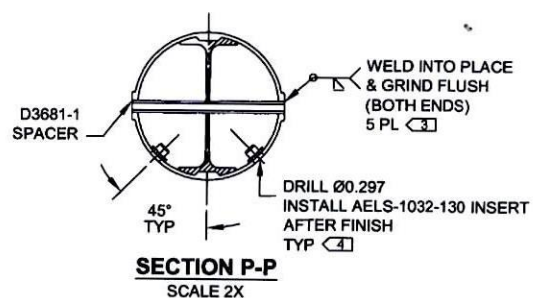
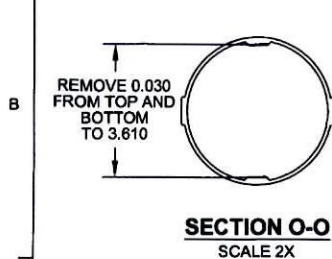
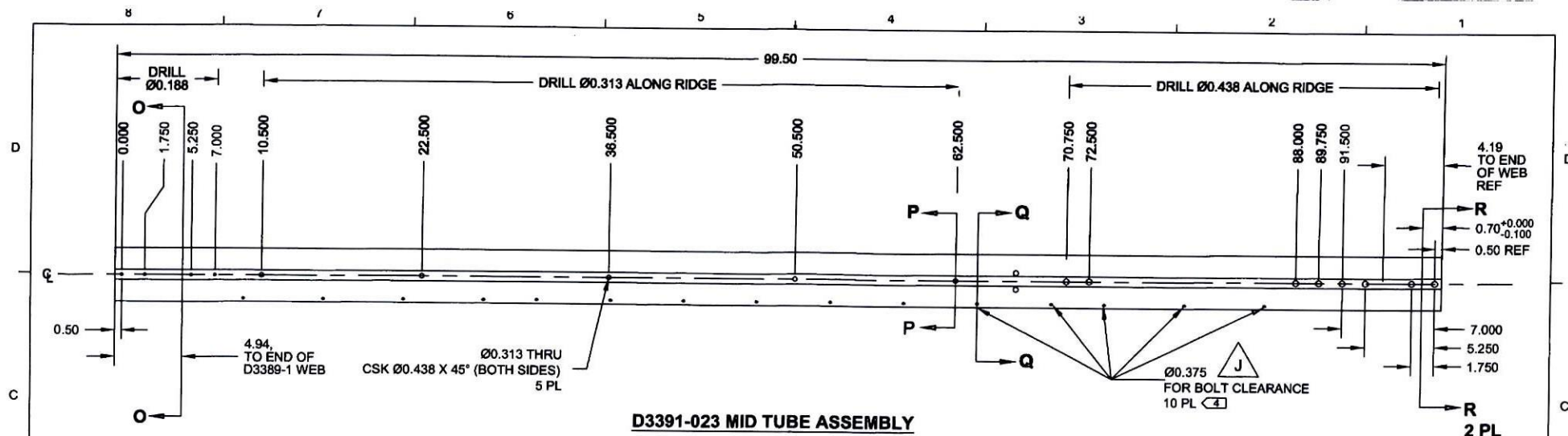
|            |          |
|------------|----------|
| DESIGN     | PH       |
| DRAWN      | ML       |
| CHECKED    | CP       |
| MFG. APPR. |          |
| APPROVED   |          |
| DE APPR.   |          |
| DATE       | 16.01.14 |

### DART AEROSPACE USA, INC

EUGENE, OR  
DRAWING NO. REV. J  
D3391 SHEET 6 OF 11  
TITLE SCALE  
412 FLOAT SKIDTUBE NTS

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**D3391-023 MID TUBE ASSEMBLY PARTS LIST**

| QTY  | PART NUMBER   | DESCRIPTION       |
|------|---------------|-------------------|
| -023 | D3391-023     | MID TUBE ASSEMBLY |
| 1    | D2500-1-100   | EXTRUSION         |
| 1    | D3389-1       | WEB               |
| 5    | D3681-1       | SPACER            |
| 20   | AELS-1032-130 | INSERT            |



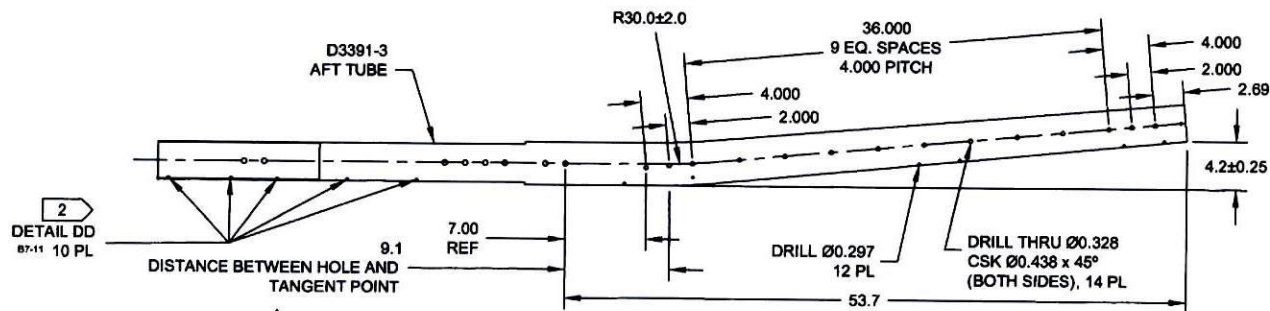
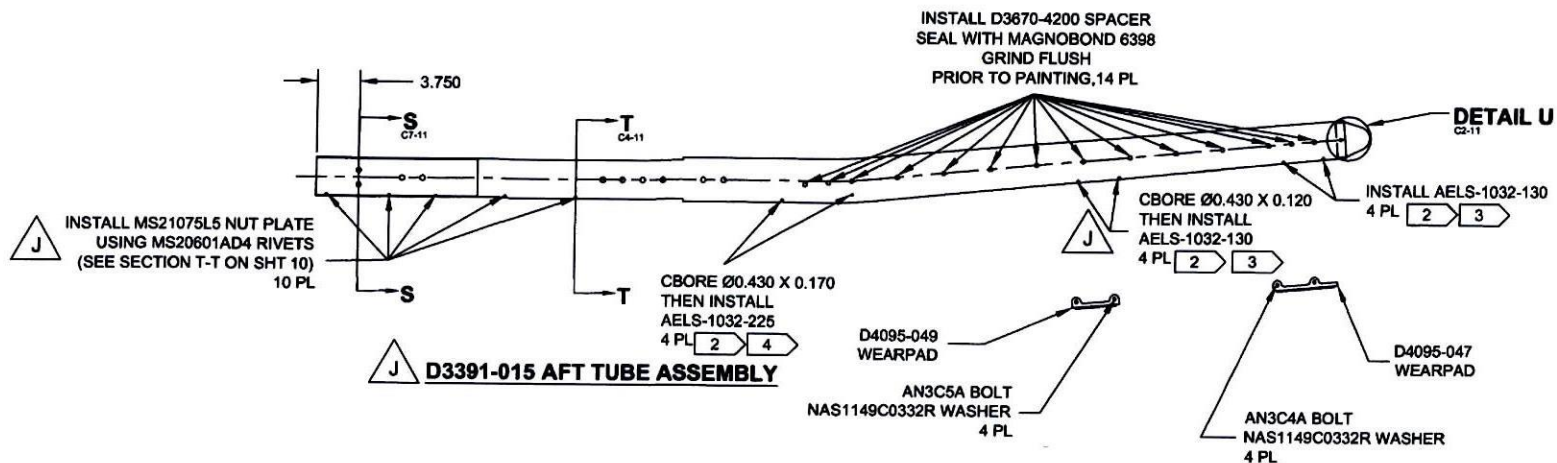
**D3391-023 MID TUBE ASSEMBLY**

- 1) MATERIAL: MAKE FROM D2500-1-100
- 2) INSTALL D3389-1 WEB TO OUTER TUBE USING SIKAFLEX-241/-291 PER QSI 015
- 3) WELDING: PER DART QSI 004
- 4) USE DART DRILL TEMPLATE DT8217 TO LOCATE AND DRILL Ø0.297 AND Ø0.375 HOLES FOR WEARSHOE INSERTS AND NUTPLATES. BORE AS NOTED AND INSTALL INSERT/NUTPLATES EXCEPT WHERE INDICATED.

|                                                                                                                                                                                                                                     |                                                                                       |                                             |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------|---------------|
| DESIGN                                                                                                                                                                                                                              | PH                                                                                    | <b>DART AEROSPACE USA, INC</b>              |               |
| DRAWN                                                                                                                                                                                                                               | ML                                                                                    | EUGENE, OR                                  |               |
| CHECKED                                                                                                                                                                                                                             | CP                                                                                    | DRAWING NO.                                 | REV. J        |
| MFG. APPR.                                                                                                                                                                                                                          |  | D3391                                       | SHEET 7 OF 11 |
| APPROVED                                                                                                                                                                                                                            |  | TITLE                                       | SCALE         |
| DE APPR.                                                                                                                                                                                                                            |  | 412 FLOAT SKIDTUBE                          | NTS           |
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# D3391-015 AFT TUBE ASSEMBLY PARTS LIST

| QTY -015 | PART NUMBER   | DESCRIPTION         |
|----------|---------------|---------------------|
| X        | D3391-015     | AFT TUBE ASSEMBLY   |
| 1        | D2646         | AFT CAP             |
| 1        | D3391-3       | AFT TUBE            |
| 14       | D3670-4200    | SPACER              |
| 2        | D3672-1       | WASHER              |
| 1        | D4095-049     | WEARPAD             |
| 1        | D4095-047     | WEARPAD             |
| 8        | AELS-1032-130 | INSERT              |
| 4        | AELS-1032-225 | INSERT              |
| 4        | ALS4-428-165  | INSERT              |
| 6        | AN3C4A        | BOLT                |
| 4        | AN3C5A        | BOLT                |
| 20       | MS20601AD4    | RIVET, BLIND        |
| 10       | MS21075L5     | NUT PLATE, FLOATING |
| 10       | NAS1149C0332R | WASHER              |

## NOTES:

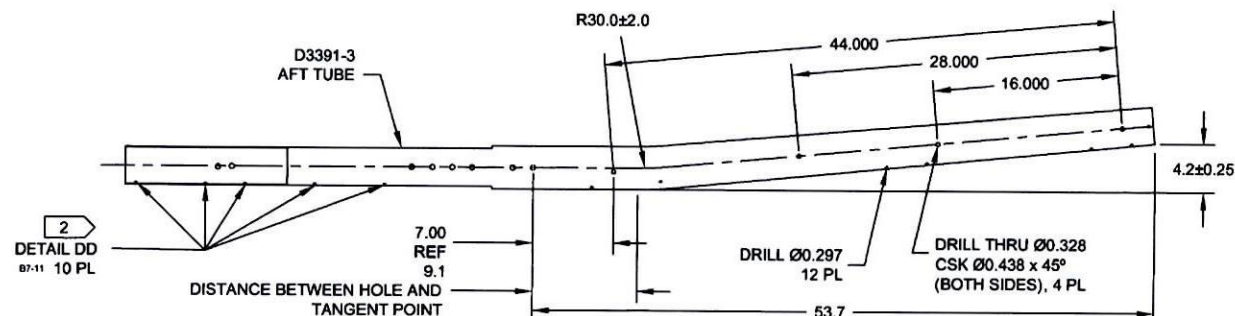
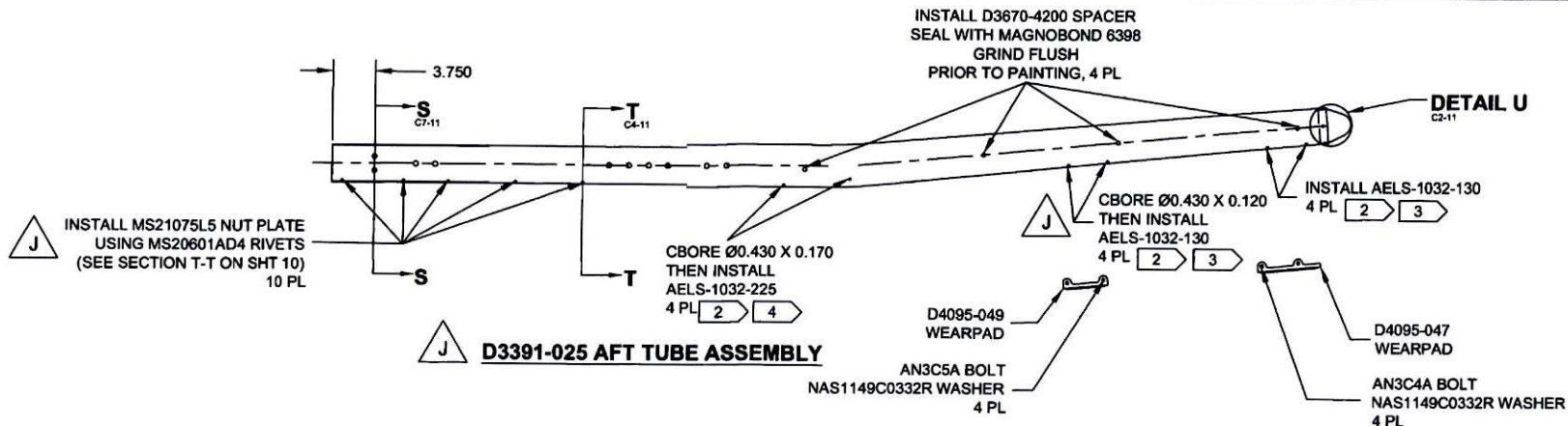
- 1) COAT ALL EXPOSED FASTENERS WITH LPS "LPS PROCYON"
- 2) USE DART DRILL TEMPLATE DT8217 TO LOCATE AND DRILL Ø0.297 AND Ø0.375 HOLES FOR WEARSHOE INSERTS AND NUTPLATES. CBORE AS NOTED AND INSTALL INSERT/NUTPLATES EXCEPT WHERE INDICATED.
- 3) ENSURE WALL THICKNESS IS BETWEEN 0.070 AND 0.130 BEFORE INSTALLING INSERT
- 4) ENSURE WALL THICKNESS IS BETWEEN 0.130 AND 0.225 BEFORE INSTALLING INSERT

## BENDING AND DRILLING DETAIL

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2016-04-28

|            |           |                                                                                                                                                                                                                                                                                   |               |
|------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| DESIGN     | PH        | DART AEROSPACE USA, INC                                                                                                                                                                                                                                                           |               |
| DRAWN      | ML        | EUGENE, OR                                                                                                                                                                                                                                                                        |               |
| CHECKED    | CP        | DRAWING NO.                                                                                                                                                                                                                                                                       | REV. J        |
| MFG. APPR. | <i>CP</i> | D3391                                                                                                                                                                                                                                                                             | SHEET 8 OF 11 |
| APPROVED   | <i>CP</i> | TITLE                                                                                                                                                                                                                                                                             | SCALE         |
| DE APPR.   | <i>CP</i> | 412 FLOAT SKIDTUBE                                                                                                                                                                                                                                                                | NTS           |
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### J BENDING AND DRILLING DETAIL

#### D3391-025 AFT TUBE ASSEMBLY PARTS LIST

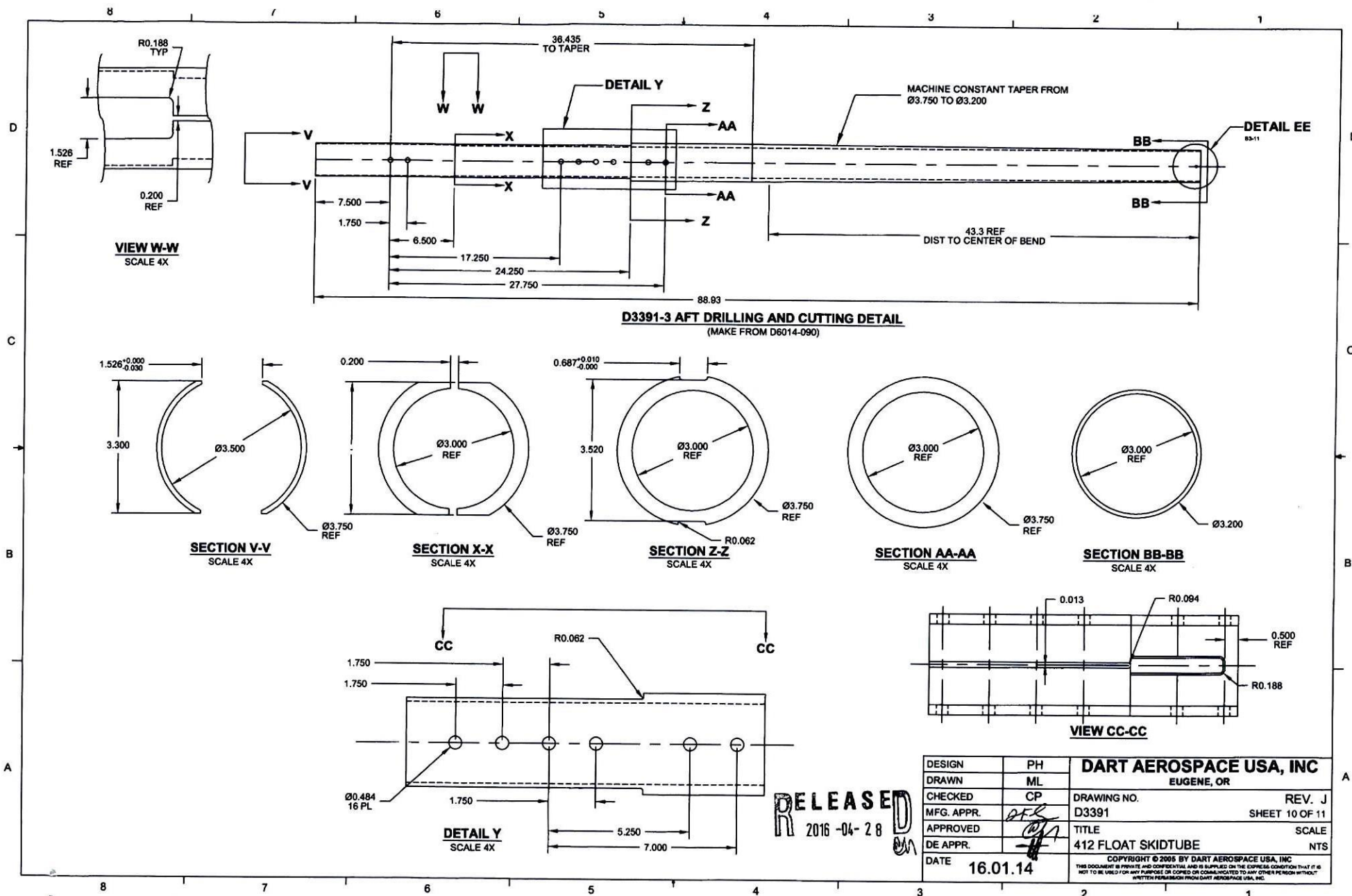
| QTY | PART NUMBER   | DESCRIPTION        |
|-----|---------------|--------------------|
| X   | D3391-025     | AFT TUBE ASSEMBLY  |
| 1   | D2646         | AFT CAP            |
| 1   | D3391-3       | AFT TUBE           |
| 4   | D3670-4200    | SPACER             |
| 2   | D3672-1       | WASHER             |
| 1   | D4095-049     | WEARPAD            |
| 1   | D4095-047     | WEARPAD            |
| 8   | AELS-1032-130 | INSERT             |
| 4   | AELS-1032-225 | INSERT             |
| 6   | AN3C4A        | BOLT               |
| 4   | AN3C5A        | BOLT               |
| 20  | MS20601AD4    | RIVET, BLIND       |
| 10  | MS21075L5     | NUT PLATE FLOATING |
| 10  | NAS1149C0332R | WASHER             |

#### NOTES:

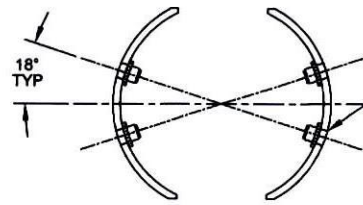
- 1) COAT ALL EXPOSED FASTENERS WITH LPS "LPS PROCYON"
- 2) USE DART DRILL TEMPLATE DT8217 TO LOCATE AND DRILL Ø0.297 AND Ø0.375 HOLES FOR WEARSHOE INSERTS AND NUTPLATES. CBORE AS NOTED AND INSTALL INSERT/NUTPLATES EXCEPT WHERE INDICATED. USE NUT PLATE DRILL JIG IF REQUIRED.
- 3) ENSURE WALL THICKNESS IS BETWEEN 0.070 AND 0.130 BEFORE INSTALLING INSERT
- 4) ENSURE WALL THICKNESS IS BETWEEN 0.130 AND 0.225 BEFORE INSTALLING INSERT

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2016-04-28

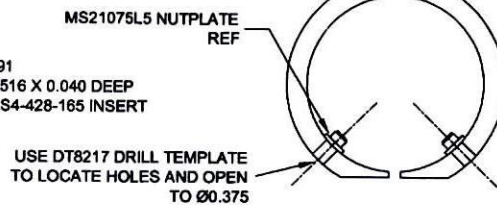
|            |           |                                                                                                                                                                                                                                                                                                                                                                                                              |               |
|------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| DESIGN     | PH        | <b>DART AEROSPACE USA, INC</b>                                                                                                                                                                                                                                                                                                                                                                               |               |
| DRAWN      | ML        | EUGENE, OR                                                                                                                                                                                                                                                                                                                                                                                                   |               |
| CHECKED    | CP        | DRAWING NO.                                                                                                                                                                                                                                                                                                                                                                                                  | REV. J        |
| MFG. APPR. | <i>CP</i> | D3391                                                                                                                                                                                                                                                                                                                                                                                                        | SHEET 9 OF 11 |
| APPROVED   | <i>ML</i> | TITLE                                                                                                                                                                                                                                                                                                                                                                                                        | SCALE         |
| DE APPR.   | <i>ML</i> | AFT TUBE ASSEMBLY                                                                                                                                                                                                                                                                                                                                                                                            | NTS           |
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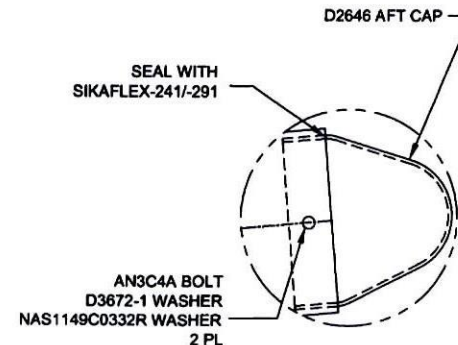
|            |            |                                                                                                                                                                                                                                                                                                    |                |
|------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| DESIGN     | PH         | <b>DART AEROSPACE USA, INC</b>                                                                                                                                                                                                                                                                     |                |
| DRAWN      | ML         | EUGENE, OR                                                                                                                                                                                                                                                                                         |                |
| CHECKED    | CP         | DRAWING NO.                                                                                                                                                                                                                                                                                        | REV. J         |
| MFG. APPR. | <i>DEF</i> | D3391                                                                                                                                                                                                                                                                                              | SHEET 10 OF 11 |
| APPROVED   | <i>DEF</i> | TITLE                                                                                                                                                                                                                                                                                              | SCALE          |
| DE APPR.   | <i>DEF</i> | 412 FLOAT SKIDTUBE                                                                                                                                                                                                                                                                                 | NTS            |
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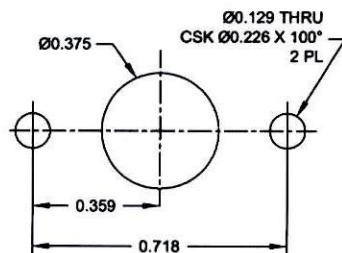
**SECTION S-S** D5-8.9  
SCALE 5X



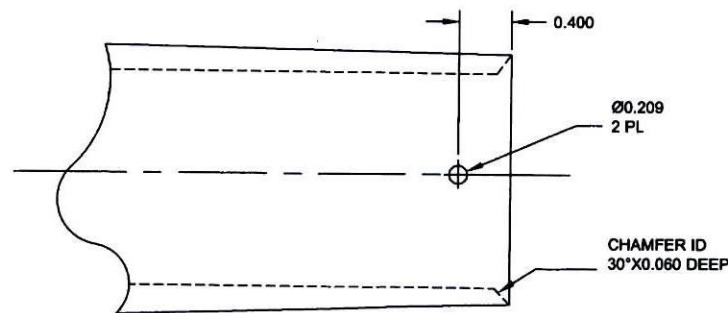
**SECTION T-T** D5-8.9  
SCALE 5X  
5 PL



**DETAIL U** D1-8.9  
SCALE 5X



**DRILLING DETAIL DD** D7-4.9  
SCALE 10X



**DETAIL EE** D1-11  
SCALE 2X

**NOTES:**  
1) USE INDUSTRY STANDARD NUT PLATE DRILL JIG IF REQUIRED.

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|            |          |                                                                                                                                                                                                                                                                                                                               |                |
|------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| DESIGN     | PH       | <b>DART AEROSPACE USA, INC</b>                                                                                                                                                                                                                                                                                                |                |
| DRAWN      | ML       | EUGENE, OR                                                                                                                                                                                                                                                                                                                    |                |
| CHECKED    | CP       | DRAWING NO.                                                                                                                                                                                                                                                                                                                   | REV. J         |
| MFG. APPR. | YR       | D3391                                                                                                                                                                                                                                                                                                                         | SHEET 11 OF 11 |
| APPROVED   | AS       | TITLE                                                                                                                                                                                                                                                                                                                         | SCALE          |
| DE APPR.   | SH       | AFT TUBE ASSEMBLY                                                                                                                                                                                                                                                                                                             | NTS            |
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2

|                                          |               |                              |
|------------------------------------------|---------------|------------------------------|
| <b>DART AEROSPACE LTD</b>                |               | <b>Work Order:</b> 167 283-A |
| <b>Description:</b> Float Skidtube (412) |               | <b>Part Number:</b> D3391-3  |
| <b>Inspection Dwg:</b> D3391             | <b>Rev:</b> J | <b>Page 1 of 1</b>           |

### FIRST ARTICLE INSPECTION CHECKLIST

| Drawing Dimension    | Tolerance | Actual Dimension | Accept | Reject | Method of Inspection | Comments |
|----------------------|-----------|------------------|--------|--------|----------------------|----------|
| <b>Lathe Section</b> |           |                  |        |        |                      |          |
| 14.000               | +/-0.010  | 14.0             | ✓      |        | TAPE                 |          |
| 3.500                | +/-0.010  | 3.507            | ✓      |        | VERN 08              |          |
| Ø3.200               | +/-0.010  | 3.198            | ✓      |        |                      |          |
| Ø3.750               | +/-0.010  | 3.748            | ✓      |        |                      |          |
| 30° x 0.060 chamfer  | +/-0.010  | .070             | ✓      |        |                      |          |
| 88.93                | +/-0.030  | 88.920           | ✓      |        | TAPE                 |          |

|                         |                         |
|-------------------------|-------------------------|
| <b>Measured by:</b> PMP | <b>Date:</b> 2017-11-02 |
| <b>Audited by:</b> PD   | <b>Date:</b> 17-11-13   |

|                     |               |        |   |  |        |         |
|---------------------|---------------|--------|---|--|--------|---------|
| <b>HAAS Section</b> |               |        |   |  |        |         |
| 1.526               | +0.000/-0.030 | 1.510  | ✓ |  | Kt-05  | ✓ vern. |
| 7.500               | +/-0.010      | 7.500  | ✓ |  | " "    | " "     |
| 27.750              | +/-0.010      | 27.750 | ✓ |  | TAPE   | ✓       |
| 31.750              | +/-0.010      | 31.750 | ✓ |  | " "    | ✓       |
| 35.250              | +/-0.010      | 35.250 | ✓ |  | " "    | ✓       |
| 3.300               | +/-0.010      | 3.300  | ✓ |  | Kt-05  | vern    |
| 0.200               | +/-0.010      | 0.200  | ✓ |  | " "    | " "     |
| 3.520               | +/-0.010      | 3.520  | ✓ |  | H-G-10 | micro   |
| 0.687               | +0.010/-0.000 | 0.689  | ✓ |  | Kt-05  | vern    |
| R0.062              | +/-0.010      | 0.0625 | ✓ |  | R-G    | ✓       |
| Ø0.484              | +0.005/-0.001 | 0.486  | ✓ |  | Kt-05  | vern.   |

|                          |                       |
|--------------------------|-----------------------|
| <b>Measured by:</b> 1.24 | <b>Date:</b> 17-12-03 |
| <b>Audited by:</b> 9.89  | <b>Date:</b> 17/12/04 |

| Rev | Date     | Change                                     | Revised by | Approved |
|-----|----------|--------------------------------------------|------------|----------|
| A   | 06.04.24 | New Issue P/O D3391-015/-025               | KJ/JLM     |          |
| B   | 06.06.19 | Dwg revision update                        | KJ/JLM     |          |
| C   | 07.04.20 | Ø0.208 dimension removed                   | KJ/JLM     |          |
| D   | 07.09.06 | 0.400 dimension removed                    | KJ/JLM     |          |
| E   | 07.11.23 | Dwg Rev. updated                           | KJ/EC/DD   |          |
| F   | 09.04.27 | Dimensions updated per Rev H and NCR09-028 | KJ/JLM     |          |
| G   | 09.11.16 | Dimension 0.200 removed                    | KJ         |          |
| H   | 11.06.21 | Dimension 44.995 removed                   | KJ         |          |
| I   | 12.05.15 | Dwg Rev updated                            | KJ         |          |
| J   | 12.05.23 | Dimension updated                          | KJ         |          |
| K   | 12.10.15 | 88.93 dimension removed                    | KJ         |          |
| L   | 12.11.28 | 88.93 dimension added                      | KJ         |          |
| M   | 16.06.23 | Dimensions updated per Rev J               | KJ         |          |





DQA: \_\_\_\_\_ Date: \_\_\_\_\_

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: \_\_\_\_\_

Date: \_\_\_\_\_

Work Order update only ☐

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                              |  |  |  |                                    |                                     |                                    |                                      |                                               |                                    |                                            |                                  |                                        |                                    |                                              |                                |                                    |                                    |                                   |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--|--|--|------------------------------------|-------------------------------------|------------------------------------|--------------------------------------|-----------------------------------------------|------------------------------------|--------------------------------------------|----------------------------------|----------------------------------------|------------------------------------|----------------------------------------------|--------------------------------|------------------------------------|------------------------------------|-----------------------------------|--|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input checked="" type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/>                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><table style="width:100%; font-size: small;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Cross tube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input checked="" type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table> |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                              |  |  |  | Skid-tube <input type="checkbox"/> | Cross tube <input type="checkbox"/> | Water Jet <input type="checkbox"/> | Engineering <input type="checkbox"/> | Machining <input checked="" type="checkbox"/> | Small Fab <input type="checkbox"/> | Prod. Eng. Coord. <input type="checkbox"/> | Quality <input type="checkbox"/> | Thermoforming <input type="checkbox"/> | Finishing <input type="checkbox"/> | Rec/Store/Packaging <input type="checkbox"/> | Other <input type="checkbox"/> | Large Fab <input type="checkbox"/> | Composite <input type="checkbox"/> | Supplier <input type="checkbox"/> |  |
| Skid-tube <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Cross tube <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Water Jet <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                     | Engineering <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                              |  |  |  |                                    |                                     |                                    |                                      |                                               |                                    |                                            |                                  |                                        |                                    |                                              |                                |                                    |                                    |                                   |  |
| Machining <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Small Fab <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Prod. Eng. Coord. <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                             | Quality <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                              |  |  |  |                                    |                                     |                                    |                                      |                                               |                                    |                                            |                                  |                                        |                                    |                                              |                                |                                    |                                    |                                   |  |
| Thermoforming <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Finishing <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Rec/Store/Packaging <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                           | Other <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                              |  |  |  |                                    |                                     |                                    |                                      |                                               |                                    |                                            |                                  |                                        |                                    |                                              |                                |                                    |                                    |                                   |  |
| Large Fab <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Composite <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Supplier <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                              |  |  |  |                                    |                                     |                                    |                                      |                                               |                                    |                                            |                                  |                                        |                                    |                                              |                                |                                    |                                    |                                   |  |
| Date : 17/12/4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Step #: 120                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | QTY Effective : (1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                   | MRB (QSI042) Approval<br>DAS 12 9-89 17/12/4 |  |  |  |                                    |                                     |                                    |                                      |                                               |                                    |                                            |                                  |                                        |                                    |                                              |                                |                                    |                                    |                                   |  |
| Description Work Order Deviation                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                              |  |  |  |                                    |                                     |                                    |                                      |                                               |                                    |                                            |                                  |                                        |                                    |                                              |                                |                                    |                                    |                                   |  |
| Find edge chamfered to remove chatter.<br>Approx. 1" long region, Approx. 0.18 mat'l removed.                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Acceptable. No stress in affected region                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                              |  |  |  |                                    |                                     |                                    |                                      |                                               |                                    |                                            |                                  |                                        |                                    |                                              |                                |                                    |                                    |                                   |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Completed By<br>DAS 12 9-89 17/12/4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                              |  |  |  |                                    |                                     |                                    |                                      |                                               |                                    |                                            |                                  |                                        |                                    |                                              |                                |                                    |                                    |                                   |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Lead hand / Supervisor<br>Approval Verification<br><br>PD 17-12-4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                              |  |  |  |                                    |                                     |                                    |                                      |                                               |                                    |                                            |                                  |                                        |                                    |                                              |                                |                                    |                                    |                                   |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | QC / QA Coordinator<br>Approval<br><br>PD 17-12-4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                              |  |  |  |                                    |                                     |                                    |                                      |                                               |                                    |                                            |                                  |                                        |                                    |                                              |                                |                                    |                                    |                                   |  |
| Root Cause                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | FAULT CATEGORY                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                              |  |  |  |                                    |                                     |                                    |                                      |                                               |                                    |                                            |                                  |                                        |                                    |                                              |                                |                                    |                                    |                                   |  |
| Environment <input type="checkbox"/><br>Design <input type="checkbox"/><br>Doc/Data <input type="checkbox"/><br>Equip/Tooling <input type="checkbox"/><br>Handling/Pre <input type="checkbox"/><br>Material <input type="checkbox"/><br>Internal Transport <input type="checkbox"/><br>Tribal Knowledge <input type="checkbox"/><br>LOA <input type="checkbox"/><br>Substation <input type="checkbox"/><br>Past Expiry Date <input type="checkbox"/><br>Misidentified <input type="checkbox"/> | No Re-verification <input type="checkbox"/><br>Operator <input type="checkbox"/><br>Offset/Setup <input type="checkbox"/><br>Supplier <input type="checkbox"/><br>Training <input type="checkbox"/><br>Use for Testing <input type="checkbox"/><br>Poor Information <input type="checkbox"/><br>Rushing <input type="checkbox"/><br>Product Improvement <input type="checkbox"/><br>Process Improvement <input type="checkbox"/><br>Manufacturing Process <input checked="" type="checkbox"/><br>Past Due <input type="checkbox"/> | Pressure/Forced <input type="checkbox"/><br>Bending <input type="checkbox"/><br>Centre Not Concentric <input type="checkbox"/><br>Cracks <input type="checkbox"/><br>Crimp/Kink/Ripple/Wave <input type="checkbox"/><br>Cuffs <input type="checkbox"/><br>Crushing <input type="checkbox"/><br>Heat Treat <input type="checkbox"/><br>Wave/Twist in Tube <input type="checkbox"/><br>Marks/Chatter <input checked="" type="checkbox"/> | Temperature/Cure <input type="checkbox"/><br>Set-up <input type="checkbox"/><br>BOM/Route <input type="checkbox"/><br>Broken/Damage/Defect <input type="checkbox"/><br>Inspection Incomplete/Unqualified <input type="checkbox"/><br>Contamination <input type="checkbox"/><br>Countersink <input type="checkbox"/><br>Cut Too Short <input type="checkbox"/><br>Instructions Incomplete/Unclear <input type="checkbox"/><br>Drill Holes <input type="checkbox"/> | Power Loss/Surge <input type="checkbox"/><br>Folio/Program <input type="checkbox"/><br>Grain <input type="checkbox"/><br>Weld <input type="checkbox"/><br>Wrong Stock Pulled <input type="checkbox"/><br>Out of Sequence <input type="checkbox"/><br>Off-set <input type="checkbox"/><br>Misabeled <input type="checkbox"/><br>Fit/Function <input type="checkbox"/><br>Misaligned/off center <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Positioned Wrong <input type="checkbox"/><br>Outside Dimensions <input type="checkbox"/><br>Over/Under tolerance <input type="checkbox"/><br>Part Incorrect <input type="checkbox"/><br>Part Lost/Missing <input type="checkbox"/><br>Part Moved <input type="checkbox"/><br>Drawing <input type="checkbox"/><br>Finish <input type="checkbox"/><br>Misread <input type="checkbox"/><br>Turning Sequence <input type="checkbox"/> |                                              |  |  |  |                                    |                                     |                                    |                                      |                                               |                                    |                                            |                                  |                                        |                                    |                                              |                                |                                    |                                    |                                   |  |
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